

CLAIMS

What is claimed is:

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1. A method for facilitating operations related to data storage between a first device and at least one data storage unit in a computer network, comprising the steps of:
- causing generation of a non-network protocol transaction;
- representing the non-network protocol transaction in at least one network protocol data unit;
- 10 processing at least one network protocol data unit based on a storage services protocol set to facilitate transmission of the data unit;
- extracting the non-network protocol transaction from the network protocol data unit; and
- operating upon the non-network protocol transaction.
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2. The method of claim 1 wherein said processing step includes the further step of balancing loads associated with selected read transactions.
3. The method of claim 1 wherein said processing step includes the further step
- 20 of duplicating data units associated with selected write transactions to achieve mirroring.
4. The method of claim 1 wherein said processing step includes the further step of duplicating data units associated with selected transactions to achieve N-way
- 25 mirroring.
5. The method of claim 1 wherein said processing step includes the further step of duplicating selected metadata.
- 30 6. The method of claim 1 wherein said processing step includes the further step of ensuring right to access based on originator.
7. The method of claim 1 wherein said processing step includes the further step of blocking access to selected destinations.

8. The method of claim 1 wherein said processing step includes the further step of monitoring and logging access.

5 9. The method of claim 8 wherein said processing step includes the further step of employing results from access monitoring and logging to detect unauthorized intrusion.

10 10. Apparatus that facilitates operations related to data storage between a first device and at least one data storage unit in a computer network, comprising:
a filesystem that indicates location of data stored on at least one data storage unit, and
circuitry that processes network protocol data units associated with the operations based on storage services protocol set information to facilitate
15 transmission of the data unit.

11. The apparatus of claim 10 wherein said circuitry balances loads associated with selected read transactions.

20 12. The apparatus of claim 10 wherein said circuitry duplicates data units associated with selected write transactions to achieve mirroring.

13. The apparatus of claim 10 wherein said circuitry duplicates data units associated with selected transactions to achieve N-way mirroring.

25 14. The apparatus of claim 10 wherein said circuitry duplicates selected metadata.

15. The apparatus of claim 10 wherein said circuitry facilitates ensuring right to access based on originator.

30 16. The apparatus of claim 10 wherein said circuitry blocks access to selected destinations.

17. The apparatus of claim 10 wherein said circuitry monitors and logs access.

18. The apparatus of claim 17 wherein said circuitry employs results from access monitoring and logging to detect unauthorized intrusion.

5 19. The apparatus of claim 10 wherein said circuitry includes a host device.

20. The apparatus of claim 10 wherein said circuitry includes a switch.

21. A method for facilitating a READ operation that is initiated by a client
10 transmitting a READ transaction to at least one data storage device for data that is owned by a content owner device, comprising the steps of:

in response to said READ transaction, selecting READ metadata previously transmitted from a filesystem that is associated with the content owner to the data storage device; and

15 transmitting the READ metadata from the data storage device to the client via at least one network protocol data unit.

22. The method of claim 21 including the further step of determining whether to grant the client access to the data.

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23. The method of claim 22 including the further step of employing the transmitted READ metadata with a filesystem that is associated with the client to access the data from the at least one data storage unit.

25 24. The method of claim 23 wherein said step of employing the READ metadata includes the further step of generating a new READ transaction and transmitting the new READ transaction to the data storage units via at least one network protocol data unit.

30 25. The method of claim 24 wherein said step of generating a new READ transaction includes the further step of placing a non-network protocol READ transaction in a payload portion of at least one protocol data unit and generating a header portion for the protocol data unit.

26. Apparatus that facilitates a READ operation that is initiated by a client that transmits a READ transaction, comprising:

at least one data storage unit that includes metadata that indicates location of data at said at least one data storage unit, said data storage unit including circuitry that is operative in response to receipt of the READ transaction from the client to:

select READ metadata that corresponds to the READ operation from the content owner, and

transmit the selected READ metadata to the client via at least one network protocol data unit,

whereby the client might employ said READ metadata to obtain data directly from said at least one data storage unit.

27. The apparatus of claim 26 wherein said data storage unit includes circuitry that determines whether to grant the client access to the data based upon predefined criteria.

28. The apparatus of claim 27 further including circuitry associated with the client that is operative to generate a non-network protocol READ transaction based at least in part upon said transmitted READ metadata, and encapsulate said non-network protocol READ transaction in at least one network protocol data unit having a destination address field.

29. The apparatus of claim 28 further including a Layer 3 router that routes the at least one network protocol data unit to the data storage unit designated by the destination address.

30. The apparatus of claim 29 wherein said designated data storage unit includes an interface adapter operative to extract the encapsulated non-network protocol READ transaction from the network protocol data unit.

31. The apparatus of claim 30 wherein said designated data storage unit is operative in response to said non-network protocol READ transaction to retrieve the data that is specified by the READ transaction, and wherein said interface adapter is

further operative to place the retrieved data in at least one network protocol data unit that designates the address of the client in a destination field.